ABSTRACT

This invention provides polarization independent magnetooptic switches. Input optical signals are switched to different output ports via polarization manipulation utilizing magnetically switchable Faraday rotators, polarization beam splitters (PBS) and polarization beam combiners (PBC). The Faraday rotators are Bi-substituted magnetic garnet with small coercivity, and PBS/PBC made from birefringence crystals. The switching Faraday rotator is mounted inside a soft magnetic ferrite core, which is magnetized by an electric coil outside. To ensure a high switching speed, the selected ferrite core exhibits high frequency characteristic. Based on the same principle of polarization manipulation, a latching magnetooptic switch (only a current pulse is required) can be built using a latchable Faraday rotator as a switching control unit.. The advantages of these magnetooptic switches are high speed (~μs or faster), low insertion loss, low PDL and PMD, compactness in size, no moving parts and no liquid in the device.